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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF  
HARVARD UNIVERSITY.

NEW SERIES. — No. XIV.

By J. M. GREENMAN.

- I. Revision of the Mexican and Central American Species of *Galium*  
and *Relbunium*.
- II. Diagnoses of New and Critical Mexican Phanerogams.

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CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD  
UNIVERSITY, NEW SERIES, No. XIV.

By J. M. GREENMAN.

Presented by B. L. Robinson, April 13, 1898.

I.—REVISION OF THE MEXICAN AND CENTRAL AMERICAN SPECIES OF GALIUM AND RELBUNIUM.

A PRELIMINARY study of the Mexican and Central American species of *Galium* has made it necessary to take into consideration the North American representatives of the nearly allied genus *Relbunium*. The latter, although not so numerous represented in Mexico, increases southward and attains its maximum in South America, where it to a considerable extent replaces the genus *Galium*.

*Relbunium* was first so designated by Endlicher,<sup>1</sup> as a section under *Galium*. Subsequently it was taken up by Bentham and Hooker,<sup>2</sup> and established as a genus; a similar view being held by Schumann<sup>3</sup> and by Hemsley,<sup>4</sup> while Dr. Gray in the Synoptical Flora placed the North American representatives of *Relbunium* under *Galium*.

The typical *Relbunium*, however, is so well marked by its involucrate flowers and distinctly axillary inflorescence, that it has seemed best to the writer in the following synoptic revision to follow essentially the generic limitations laid down by Bentham and Hooker, and by Schumann in Engler and Prantl's Nat. Pflanzenfamilien.

It may be added that in the examination of a large number of specimens no difficulty whatever was experienced in placing a given specimen definitely either in one genus or in the other, except in the case of *G. angulosum*. This species is somewhat intermediate between the two genera, but a close examination of the inflorescence seems to indicate its affinity with *Galium* rather than with *Relbunium*.

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<sup>1</sup> Gen. Pl. 523.

<sup>2</sup> Gen. ii. 149.

<sup>3</sup> Fl. Bras. vi. pt. 6, 103; Engl. & Prantl, Nat. Pflanzenf. iv. Ab. 4, 154.

<sup>4</sup> Biol. Cent.-Am. Bot. ii. 62.

It will be noticed that a few species are herein treated which have not as yet been reported from Mexico or Central America. In these cases the known locality is such that the occurrence of the species may be expected in Northern Mexico. Besides the material in the Gray Herbarium, the writer, through the kindness of Dr. J. N. Rose, has been permitted to borrow from the U. S. National Museum for examination the Mexican and Central American specimens of these two genera.

**GALIUM**, Linn. (Name from ancient Greek γάλιον, supposed to be *Galium verum*, and derived by Dioscorides from γάλα, milk, which it was used to curdle.) Flowers perfect, polygamo-dioecious, or unisexual, exinvolucrate. Calyx-tube ovoid or globose; limb obsolete. Corolla rotate, usually 4-lobed (not unfrequently 3-lobed, and rarely 5-lobed); lobes valvate. Stamens of the same number and alternating with the lobes of the corolla, adnate to the base of the tube: anthers on short filaments, exserted. Disk annular. Ovary 2-celled; styles more or less 2-cleft; stigmas capitate; ovules solitary in the cells, borne on the dissepiment, amphitropous. Fruit didymous, dry, subcarneous, or distinctly baccate, smooth, tuberculate, or hispid, separating into closed carpels, or only one carpel maturing. Seeds concave on the face; embryo curved; cotyledons foliaceous; radicle inferior. — Annuals, herbaceous perennials, or rarely suffruticose plants. Leaves in whorls of 3 to many. Flowers usually disposed in axillary or terminal cymes, occasionally simply axillary, or terminal, white, yellow, greenish, or purplish. — Gen. 24; Benth. & Hook. f. Gen. ii. 149; Gray, Syn. Fl. N. A. i. pt. 2, 35 (excl. *Relbunium* in part); Schumann in Engl. & Prantl, Nat. Pflanzenf. iv. Ab. 4, 149. For generic synonyms, which relate chiefly to the Old World, see Hooker f. & Jackson, Index Kewensis, i. pt. 2, 991.

§ 1. Fruit uncinat-hispid, or granular-papillose.

- Leaves in whorls of six or eight (rarely of ten or more); the angles of the stem as well as the midrib and margins of the leaves usually retrorsely aculeolate-hispid, less frequently smoothish, or rarely (in *G. triflorum*) somewhat hirsute.

— Stems smoothish, or rarely somewhat hirsute-pubescent.

**G. TRIFLORUM**, Michx. Herbaceous: stems more or less pubescent: leaves elliptic-lanceolate to narrowly oblong-lanceolate, cuspidate-acuminate, 1.5 to 4 or rarely 8 cm. long, 5 to 10 or rarely 15 mm. broad, usually covered on the upper surface near the margin with subappressed hispidulous hairs, often slightly hispid on the midrib, otherwise glabrous: inflorescence cymose, terminal, usually 3-flowered. — Fl. i. 80; Willd. Hort. Berol. t. 66; DC. Prodr. iv. 601; Torr. & Gray, Fl. ii. 23;

Gray, Syn. Fl. N. A. i. pt. 2, 39; Wiegand, Bull. Torr. Club, xxiv. 403. — Common in moist shady places; Southern Greenland and Alaska to the Gulf of Mexico.

This species is doubtfully attributed to Mexico by Hemsley, Biol. Cent.-Am. Bot. ii. 66, but no Mexican specimens have been seen by the writer.

— Angles of the stem as well as the margins and midrib of the leaves retrorsely aculeolate-hispid.

↔ Fruit granular-papillose.

1. *G. asperillum*, GRAY. Stems ascending, 3 to 6 dm. high, diffusely branched: leaves usually in whorls of six, oblanceolate, 1 to 2 cm. long, 3 to 6 mm. broad, glabrous except on the margins and midvein beneath: inflorescence cymose-paniculate, cymes dichotomously or trichotomously branching: flowers whitish: fruit about 2 mm. in diameter. — Pl. Fendl. 60, in Brew. & Wats. Bot. Calif. i. 284, & Syn. Fl. N. A. i. pt. 2, 39; Wats. Bot. King Exp. 134; Rothrock in Wheeler, Rep. vi. 138. — New Mexico, *Fendler*, no. 289; Sonora, *Wright*, no. 114; Chihuahua, hills west of the city of Chihuahua, *Pringle*, no. 558; also by the same collector on cool talus of cliffs, on neighboring mountains, no. 740; southwestern Chihuahua, August to November, 1885, *Palmer*, no. 414.

↔↔ Fruit more or less distinctly uncinat-hispid.

2. *G. aparine*, L. Stems 2 to 10 dm. or more long, somewhat reclining; nodes 2 to 10 cm. distant: leaves oblanceolate or oblanceolate-linear, 1 to 4 cm. long, 2 to 6 mm. broad, cuspidate-acuminate, usually hirsute-pubescent on the upper surface: flowers 1 to 3 in the upper axils, or terminating the lateral branches in 2-3-flowered cymes; corolla small, whitish: fruit 2 to 5 mm. in breadth. — Spec. i. 108; Reichenb. Ic. Fl. Germ. xvii. t. 1197; Gray, Syn. Fl. N. A. i. pt. 2, 36. — Sonora, *Thurber*, no. 437; Lower California, Guadalupe Island, *Palmer*, nos. 35, 850, All Saints' Bay, April, 1882, *Miss F. E. Fish*. — To the var. *Vaillantii*, Koch, Fl. Germ. ed. 1, 330 (Vaill. Par. t. 4, f. 4), some of the specimens above cited may be equally well referred. The variety differs only in being more slender, but as direct transitions occur no satisfactory distinctions can be drawn separating the variety from the species.

3. *G. mexicanum*, HBK. Stems ascending, much branched, strongly aculeolate-hispid on the angles, hirsute-pubescent at the nodes: leaves usually in sixes or eights, sometimes in whorls of ten or more, 8 to 20 mm. long, 1 to 3 mm. broad, margin revolute, apex strongly cuspidate-acuminate, usually smooth and shining above, rarely somewhat

hirtellous: inflorescence cymose-paniculate: corolla white or purplish, campanulate; lobes revolute, externally pubescent: fruit covered with rather short uncinat-hispid bristles. — Nov. Gen. & Spec. iii. 337; Hemsl. Biol. Cent.-Am. Bot. ii. 65. — Guanajuato, *Dugès*; Valley of Mexico, *Pringle*, no. 6518; Jalisco, Rio Blanco, *Palmer* (collection of 1886), no. 753; Tepic, near Santa Teresa, *Rose*, no. 2151; Orizaba, *Seaton*, no. 127. A specimen from Culiacan, *Palmer* (collection of 1891), no. 2777, may be doubtfully referred here.

**Var. glabratum.** Nearly glabrous throughout, otherwise as in the typical form. — Collected by *E. W. Nelson* on the west slope of Mt. Zempoaltepec, Oaxaca, altitude 2370 to 2460 m., 5 to 13 July, 1894, no. 583.

**Var. platyphyllum.** Similar to the species proper, but with broader oblanceolate or oblong-spatulate leaves, 1 to 2 cm. long, 2 to 6 mm. wide, abruptly cuspidate-acuminate at the rounded summit, not unfrequently hirtellous-puberulent beneath and occasionally hirsutish above. — Chiapas, near Christobal, altitude 2150 to 2704 m., 18 September, 1895, *E. W. Nelson*, nos. 3165, 3200; Oaxaca, Sierra de San Felipe, altitude 3075 m., 28 June, 1894, *Pringle*, no. 5663; vicinity of Yolontepec, altitude 1700 to 2150, 15 to 20 July, 1894, *Nelson*, no. 714; Colima, 9 January to 6 February, 1891, *Palmer*, no. 1407.

\* \* Leaves in whorls of four: the angles of the stem aculeolate-hispidulous: flowers cymose.

4. *G. prætermissum*, GREENM. Stems slender, 3 to 4 dm. long, ascending from a perennial base, slightly hispidulous: leaves linear-lanceolate to linear, 8 to 14 mm. long, 1 to 3 mm. broad, acute, margins revolute, upper surface often slightly hispidulous, the lower glabrous: flowers terminating the lateral branches in subtrichotomous cymes. — Proc. Am. Acad. xxxii. 306. — Federal District, *Pringle*, no. 6596.

\* \* \* Leaves in fours: hirsute-pubescent to nearly glabrous plants, not retrorsely aculeolate-hispid: flowers terminating the stems and branches in rather close, or dichotomously branching cymes.

— Flowers paniculately disposed in dichotomously branching leafy cymes: uncinat bristles of the fruit subappressed.

5. *G. Pringlei*. Stems 3 to 5 dm. high, erect or ascending from a perennial base, covered with a spreading hirsute pubescence: leaves in fours, the uppermost opposite, 1-nerved, oblong-elliptic to oblong-lanceolate, 4 to 12 mm. long, 1 to 5 mm. broad, submucronate, narrowed at the base, hirsute-pubescent upon either surface: flowers sessile or short-pedicelled: corolla whitish: fruit about 1.5 mm. in breadth, covered with

subappressed uncinat hairs. — Collected by *C. G. Pringle* on shaded ledges of the Sierra Madre near Monterey, State of Nuevo Leon, 9 July, 1898, no. 1884, distributed as "*Galium uncinulatum*, DC.?"

+ + Flowers in terminal or lateral few-several-flowered loose cymes: uncinat bristles of the fruit spreading.

6. *G. orizabense*, HEMSL. An herbaceous perennial: stems 3 to 10 dm. or more long, erect or ascending, hirtellous-pubescent especially on the angles with short recurved hairs: leaves obscurely 3-nerved, linear-lanceolate or linear-oblong, 0.5 to 2 cm. long, 1.5 to 5 mm. wide, obtuse, a little narrowed at the base, usually hirtellous-pubescent upon either surface, and especially on the midrib beneath. — *Diag. Pl. Nov. pars tertia*, 54, & *Biol. Cent.-Am. Bot. ii.* 65. — Region of Orizaba, *Sumichrast*, nos. 838, 1933; *Müller*, nos. 1144, 1326; *Botteri*, no. 538.

7. *G. uncinulatum*, DC. Stems slender, usually several from a perennial base, nearly glabrous or pubescent with spreading or somewhat reflexed hirsute hairs: leaves 3-nerved from the subpetiolate base, oblong to oblong-lanceolate, mucronate, more or less hirsute upon either surface, especially on the veins beneath, sometimes nearly glabrous: inflorescence terminating the lateral branches in three-few-flowered cymes. — *Prodr.* iv. 600; *Hemsl. Biol. Cent.-Am. Bot. ii.* 66; *Wats. Proc. Am. Acad.* xviii. 99. *G. Jalapense*, Schlecht. *Linnæa*, ix. 591. — Sonora, *F. E. Lloyd*, no. 393; Nuevo Leon, Guajuco, *Palmer*, March, 1880, no. 412; San Luis Potosi, *Schaffner*, no. 840 (a nearly smooth form); Valley of Mexico, *Schaffner*, no. 179, *Pringle*, no. 6462; Orizaba, *Botteri*, nos. 188, 945, 1174, *Müller*, no. 1820, *Seaton*, no. 209, *Sumichrast*, no. 1921; Oaxaca, vicinity of Cerro San Felipe, *Nelson*, no. 1103. Specimens collected by *Pringle*, San Luis Potosi, no. 5125, and Puebla, no. 7018, seem to connect with the following variety.

Var. *obstipum*, WATS. Leaves usually smaller, suborbicular to oblanceolate, densely hirsute-pubescent beneath. — *Proc. Am. Acad.* xviii. 99. *G. obstipum*, and varieties, Schlecht. *Linnæa*, ix. 592; *Hemsl. Biol. Cent.-Am. Bot. ii.* 65. — Coahuila, *Lerios*, about 70 km. east of Saltillo, July, 1880, *Palmer*, no. 413, by the same collector in the Caracol Mts., 33 km. east of Monclova, August, 1880, no. 414; Michoacan, Patzcuaro hills, 8 November, 1890, *Pringle*, no. 3597; Real del Monte, *Th. Coulter*, no. 185; Chiapas, *Ghiesbreght*, no. 886; Guatemala, Coban, Depart. Alta Verapaz, altitude 1325 m., *von Tuerckheim* (Donnell Smith's sets, no. 1222).

Var. (?) *nanum*. Low, about 1 dm. high: stems glabrous or slightly pubescent at the nodes: leaves oblanceolate, 5 to 10 mm. long,



2 to 3.5 mm. broad, submucronate, narrowed into a subpetiolate base, glabrous or somewhat hirtellous on the upper surface and on the margin, rather densely elongate-punctate: flowers terminating the lateral branches usually in 3-flowered cymes.—Collected about Orizaba by Müller in 1885, no. 1523.

+ + + Flowers terminating the stems and branches in small close cymes: uncinat bristles of the fruit spreading.

↔ Essentially glabrous: flowers usually white or greenish white.

8. *G. Seatonii*. Perennial: stems prostrate or ascending, much branched, glabrous: leaves sessile, broadly oblong to oblong-lanceolate, 3 to 10 mm. long, 1.5 to 5 mm. broad, submucronate or short-acuminate, glabrous or slightly hirtellous on the upper surface: corolla about 3 mm. broad, 4-lobed; lobes oblong-ovate, acute: pedicels later becoming somewhat elongated, 3 to 8 mm. in length: fruit 1.5 mm. in breadth.—Mt. Orizaba, altitude 3075 m., 5 August, 1891, *Henry E. Seaton*, no. 174, distributed as *G. uropetalum*, Hemsl.; Federal District, Serrania de Ajusco, altitude 3075 m., 6 September, 1896, *Pringle*, no. 6461, distributed as *G. Jalapense*, Schlecht.

↔ ↔ Hirsute-pubescent: flowers purplish.

9. *G. Nelsonii*. Perennial: stems ascending, 1 to 2 dm. in length, more or less branched, hirsute-pubescent upon the angles and also at the nodes: leaves sessile, ovate or slightly oblong-ovate, acute, usually hirsute-pubescent above and on the midrib beneath, margin ciliate: flowers, bracts, and upper leaves purplish: corolla about 3 mm. in diameter, 4-parted; lobes oblong-ovate, obtusish.—Summit of Mt. Zempoaltepec, Oaxaca, altitude 3480 m., 9 July, 1894, *E. W. Nelson*, no. 628.

• • • • Leaves in fours: inflorescence chiefly axillary.

+ Flowers on slender pedicels.

*G. TEXENSE*, Gray. Annual, branching from the base: stems more or less erect, 1 to 3 or 4 dm. high, hirsute-pubescent: leaves ovate or oblong-ovate, 0.5 to 1.5 cm. long, one half to two thirds as broad, hirsute-pubescent upon either surface: peduncles axillary, slender, about equaling the leaves, occasionally proliferous: fruit 2 mm. in diameter.—Proc. Am. Acad. xix. 80, & Syn. Fl. N. A. i. pt. 2, 36. *G. Californicum*, var. *Texanum*, Torr. & Gray, Fl. ii. 20. *G. uncinulatum*, Gray, Pl. Lindh. ii. 215? not DC.—Texas, *Drummond*, no. 115, *Lindheimer*, no. 619, *Wright* (without number), on rocky hills near Austin, *E. Hall*, no. 274, along Brazos River, Palo Pinto Co., *Reverchon*. No specimens from Mexico, belonging to this species, have been seen by the writer, yet it is altogether probable that the species occurs south of the Rio Grande.



*G. CANESCENS*, HBK. Stems procumbent, nearly glabrous below, spreading-villous above: leaves ovate, 8 to 10 mm. long, 4 to 5 mm. broad, short-acuminate, 3-nerved, membranous, spreading-villous upon either surface, and upon the midrib beneath, ciliate, later somewhat glabrate: flowers axillary, solitary or terminating the branches in threes: corolla glabrous; lobes ovate, subacuminate. — Nov. Gen. & Spec. iii. 336. No Mexican specimens of this species have been seen by the author. Ghiesbreght's no. 886 from Chiapas, referred by Hemsley, Biol. Cent.-Am. Bot. ii. 64, to the above species, is best referred, as pointed out by Dr. Watson, Proc. Am. Acad. xviii. 99, to *G. uncinulatum*, DC., var. *obstipum*. The above description is drawn from Jameson's specimen collected in the Andes of Ecuador in 1859, which corresponds well with the original description.

— — Flowers sessile.

11. *G. proliferum*, GRAY. Annual, simple or branching from the base: stems ascending or erect, 1 to 4 dm. high, shortly hirsute-pubescent, or nearly glabrous: leaves ovate or oblong-ovate, the lowermost often broadly ovoid and subpetiolate, obtuse, spreading-hirsute upon either surface, often nearly or even quite glabrous: flowers sessile, terminating the rather short lateral subhorizontally spreading branches, the lateral branches often proliferous, bearing a second or even a third flower: corolla white, small: fruit about 3 mm. in breadth on extremely short recurved pedicels, subtended by two or four upturned leaf-like bracts. — Pl. Wright. ii. 67, & Syn. Fl. N. A. i. pt. 2, 37. *G. virgatum*, var. *diffusum*, Gray, Pl. Wright. i. 80. — New Mexico, Wright, nos. 1112 (type), 281; Texas, El Paso, Dr. Dieffendorfer, also collected in the same locality by Vasey in 1881; Arizona, hills near Tucson, 28 April, 1883, Pringle, no. 15, on the foothills of the Santa Rita Mountains, 13 May, 1884, Pringle, in part; Nuevo Leon, Guajuco, about 40 km. south-east of Monterey, March, 1880, Palmer, no. 411.

Var. *subnudum*. Stem and leaves glabrous: fruit only slightly hirtellous. — Foothills of the Santa Rita Mountains, Arizona, 13 May, 1884, Pringle, in part.

*G. VIRGATUM*, Nutt. Stems simple or branched from the base; branches spreading or erect, 1 to 3 dm. high, somewhat virgate, hirsute-pubescent upon the slightly thickened angles, occasionally nearly glabrous: leaves oblong-linear to oblong-lanceolate, 1 cm. or less in length, 1 to 3 mm. broad, obtusish, usually hirsutish above and on the midrib beneath, ciliate, sometimes nearly glabrous: flowers terminating the extremely short lateral branches or peduncles, appearing axillary, sub-

tended by two leaf-like bracts, the lateral branches or peduncles not proliferous, reflexed in fruit. — Torr. & Gray, Fl. ii. 20; Gray, Pl. Lindh. ii. 215, & Syn. Fl. N. A. i. pt. 2, 36. *G. Texanum*, Scheele, Linnaea, xxi. 597. — Louisiana, *Hale*; Texas, *Lindheimer*, nos. 246, 491, *Drummond*, no. 111, *Wright* (without number), at Belknap, *Sutton Hayes*, no. 327 in part, Dallas, May, 1875, *Reverchon*, *Heller*, no. 1437 (distributed as *G. Texense*, A. Gray); Missouri, Allenton, 15 June, 1880, *Geo. W. Letterman*; Tennessee, cedar barrens at La Vergue, 16 May, 1882, *Gattinger*.

VAR. LEIOCARPUM, Torr. & Gray. Stem and leaves nearly glabrous: fruit smooth and glabrous. — Torr. & Gray, Fl. ii. 20; Gray, Syn. Fl. N. A. i. pt. 2, 36. — Texas, *Drummond*, no. 113, *E. Hall*, no. 273, *Wright* (without number), also a specimen of Nuttall's collection bearing the datum "Red River."

- § 2. Fruit hirsute with long and straight (not uncinat-tipped) bristles.
- Leaves linear or linear-oblong (in *G. Wrightii*, var. *latifolium*, often somewhat elliptic or oblong-oblancoelate), 1-nerved.
- ← Flowers axillary, solitary or in pairs, subsessile.

12. *G. oresbium*. Perennial: stems from a woody base, somewhat cespitose, 1 to 2 dm. high, below often naked and glabrate, numerous branched, leafy and pilose-hirsute above: leaves in fours, linear or linear-oblong, 2 to 4 mm. long, 1 mm. or less in breadth, acutish, hirsute-pubescent, margin revolute, midrib much thickened and prominent beneath, bearing on the under surface near the apex a single large gland: corolla about 2.5 mm. in diameter, 4-parted; lobes oblong-ovate, obtuse, externally pubescent. — Collected by *C. G. Pringle*, on dry mountain walls, Sierra de la Silla, Nuevo Leon, 16 July, 1889, no. 2542.

- Inflorescence cymose-paniculate: flowers distinctly pedicellate.
- Dioecious: flowers yellowish.

*G. FENDLERI*, Gray. Stems several, erect or ascending, 1.5 to 3 dm. high, rising from a perennial base, glabrous or minutely and closely puberulent: leaves linear or linear-oblong, 0.5 to 1.5 cm. long, 1 to 3 mm. broad, acute or obtuse, glabrous or finely puberulent: flowers small: ovary bearing inconspicuous closely appressed hairs, these later spreading and becoming more prominent. — Pl. Fendl. 60, & Syn. Fl. N. A. i. pt. 2, 41. *G. Rothrockii*, Gray, Proc. Am. Acad. xvii. 203, in part (as to Rushy's plant). — New Mexico, *Fendler*, no. 288, White Mts., altitude 2300 m., *Wooton*, no. 287; Arizona, Mogollon Mts., *Rusby*, no. 155, Santa Rita Mts., 10 July, 1881, and 25 July, 1884, *Pringle*, Mt. Graham, *Rothrock*, no. 416, near Fort Huachuca, *Lemmon*, no. 2903.

++ ++ Flowers perfect or polygamo-monoecious, purplish.

13. *G. Rothrockii*, GRAY. Stems several from a woody base, profusely branched, hirtellous-pubescent below and on the young shoots, glabrous above, rarely glabrous throughout: leaves linear, 0.5 to 1.5 cm. long, rather rigid, acute or short-acuminate, subpungent-tipped, glabrous or somewhat hirtellous: lobes of corolla acuminate: fruit rather sparingly hirsute. — Proc. Am. Acad. xvii. 203 (excluding Rusby's plant), & Syn. Fl. N. A. i. pt. 2, 39. — Arizona, *Rothrock*, no. 675, *Lemmon*, nos. 526, 3010, 2718; Lower California, *Orcutt*, no. 912; Sonora, *Wright*, no. 1113 in part; Chihuahua, *Pringle*, no. 661.

14. *G. Wrightii*, GRAY. Hirsute-pubescent throughout: stems about 3 dm. high, rising from a woody base, profusely branched above: leaves linear to linear-oblong, 0.5 to 1.5 cm. long, 1 to 3 mm. broad, obtusish to mucronate-acuminate: corolla brownish purple; lobes mucronate-acuminate: fruit more densely hirsute than in the preceding species. — Pl. Wright. i. 80, ii. 67 in part, & Syn. Fl. N. A. i. pt. 2, 39. — Arizona, Apache Pass, *Lemmon*, no. 615, near Fort Huachuca, nos. 2902, 3011-2; New Mexico, *Wright*, nos. 421, 235 (type); Sonora, *Wright*, no. 1113 in part.

Var. *latifolium*, ROB. & FERN. Much less pubescent than in the species proper: leaves linear-oblong to elliptic-oblong, slightly narrowed toward the base, 0.5 to 1.5 cm. long, 1 to 5 mm. broad. — Proc. Am. Acad. xxx. 116. — Sonora, *Hartman*, no. 58.

\* \* Leaves linear-lanceolate to ovate-acuminate, lateral nerves absent.

15. *G. stellatum*, KELLOGG. Suffruticose, 2 to 6 dm. high: stems covered with a light gray or yellowish bark; branchlets hirtellous or hispidulous: leaves rather rigid, 0.5 to 1.5 cm. long, 1 to 5 mm. broad, usually attenuate-acuminate, sometimes ovate, merely acute: flowers white: fruit densely pilose-hirsute; hairs in length exceeding the diameter of the fruit. — Proc. Cal. Acad. ii. 97, f. 26; Gray, Syn. Fl. N. A. i. pt. 2, 40. *G. acutissimum*, Gray, Proc. Am. Acad. vii. 350, not of Eastwood, Proc. Cal. Acad. vi. 292 (1896). — "Between the Rio del Norte and New Mexico," *Dr. Newberry*; Southern Utah, Santa Clara, *Palmer*, no. 86; Arizona, Camp Grant, 27 April, 1867, *Palmer*, no. 105, rocky cañons of the Santa Catalina Mts., altitude 770 to 1085 m., 19 April, 1881, *Pringle*, Santa Cruz, *Parish*, no. 76, Wickenburg, *Palmer*, no. 616; Southern California, *Parish*, nos. 1724, 2381, Colorado Desert, San Diego Co., *Orcutt* (without number), Panamint Mountains, *Coville & Funston*, no. 715; Lower California, Los Angeles Bay, Gulf of California, November, 1887. *Palmer*, nos. 525, 525½, 526.

\* \* \* Leaves elliptic to oblong-ovate, usually 3-nerved from the base, bearing a single large gland or cluster of glands on the lower surface at the tip.

+ Leaves distinctly 3-nerved, margins strongly revolute.

16. *G. hypadenium*, SCHAUER. Suffrutescent: stems prostrate or ascending, glabrescent, often leafless and little branched below, covered with a thin grayish bark which later separates from the stem, freely branching above; branches tetragonal, pilose-hirsute: leaves sessile, 4 to 10 mm. or more long, nearly one half as broad, obtuse, usually hirsute-pubescent, more or less glabrate above, rather densely white-pilose or merely hirsute beneath, margins ciliate: corolla 4-parted, about 2 mm. in diameter; lobes externally pubescent with rather long hairs: fruit about 2 mm. in breadth; carpels somewhat separated at maturity. — Linnæa, xx. 700. *G. leucotrichum*, Hemsley, Biol. Cent.-Am. Bot. ii. 65, & v. t. xli. figg. 4-6. — Orizaba, Müller, nos. 174, 1218, *Sumichrast*, no. 514; Puebla, dry limestone ledges near Tehuacan, altitude 1540 m., 27 August, 1897, *Pringle*, no. 6694; Guerrero, between Chilopa and Tixtla, altitude 1540 to 2150 m., 17 December, 1894, *E. W. Nelson*, no. 2166; Jalisco, near Guadalajara, *Pringle*, 5046.

17. *G. fuscum*, MART. & GAL. Perennial: stems tetragonal, becoming more or less scabrous along the slightly thickened angles, the younger stems and branches bearing scattered pilose-hirtellous slightly curved hairs: leaves elliptic-oblong, 0.5 to 1.5 cm. long, 2 to 8 mm. broad, short-petiolate, submucronate or merely acute, glabrous or sparingly hirsute above and upon the nerves beneath, conspicuously glandular-punctate; margins usually ciliate: inflorescence cymose-paniculate: flowers brownish purple; lobes of corolla commonly pubescent. — Bull. Acad. Brux. xi. i. 126; Walp. Rep. vi. 13; Hemsley, Biol. Cent.-Am. Bot. ii. 64. — Oaxaca, Cerro de San Felipe, *Galeotti*, no. 2633, dry hills near the City of Oaxaca, altitude 1845 m., *Pringle*, no. 4795 (distributed as *G. uncinulatum*, DC., var. *abstipum*, Watson), near Reyes, altitude 1750 to 2000 m., *E. W. Nelson*, no. 1774; Guanajuato, *Dugès*.

+ + Leaves indistinctly 3-nerved, margins little or not at all revolute.

18. *G. hystriocarpum*. Stems usually many from a perennial base, ascending, more or less branched above, covered with a spreading pilose-hirsute pubescence: leaves elliptic-oblong to oblong-lanceolate, 5 to 12 mm. long, 2 to 7 mm. broad, short-acuminate or submucronate, hirsute on the upper surface and upon the midrib and inconspicuous lateral nerves beneath: flowers white, somewhat cymose-paniculate or terminating the lateral branches in few-flowered cymes: lobes of the corolla covered externally with a few long pilose hairs. — Cool cliffs and

ledges on mountains near Chihuahua, 25 October, 1886, *Pringle*, no. 741, distributed as *G. uncinulatum*, DC., var. *obstipum*, Watson.

§ 3. Fruit smooth and glabrous, dry, subcarneous or distinctly baccate.

\* Herbaceous, nearly or quite glabrous plants: leaves usually in fours, occasionally in fives, sixes, or in whorls of seven.

+ Leaves linear-oblong to spatulate-oblong, obtuse: fruit dry.

*G. BRANDEGEEI*, Gray. Low herbs: stems 0.5 to 1.5 dm. high, usually matted or cespitose-depressed, glabrous or minutely hispidulous on the angles: leaves 5 to 10 mm. long, 2 to 3 mm. broad, glabrous or slightly hispidulous on the margins and midrib beneath: flowers axillary, solitary or in pairs: pedicels in fruit usually less than 1 cm. in length. — *Proc. Am. Acad.* xii. 58, & *Syn. Fl. N. A.* i. pt. 2, 38. *G. Brandegeei*, Wiegand, *Bull. Torr. Bot. Club*, xxiv. 398. — New Mexico, Valley of the Rio Grande, *Brandeggei* (type); extending northward, according to Wiegand, to Saskatchewan. No Mexican specimens of this species have been seen by the writer, although the plant very probably occurs along the northern boundary.

19. *G. trifidum*, L., var. *subbiflorum*, WIEGAND. Stems weak, ascending, usually much branched, nearly glabrous: leaves 5 to 15 mm. long, about 2 mm. broad, obtuse or slightly rounded at the apex, slightly hispidulous on the margins. — *Bull. Torr. Bot. Club*, xxiv. 399. — Federal District, Valley of Mexico, *Pringle*, nos. 6785, 7208.

Very difficult of separation, and perhaps not distinct from *G. Claytoni*, Michx.

+ + Leaves (nearly 4 cm. in length) oblong or obovate, cuspidate or aristate: fruit subcarneous.

20. *G. glaberrimum*, HEMSL. Glabrous throughout, glaucous; branches striate: leaves in whorls of seven (or the uppermost opposite), sessile, membranous, cuneate: flowers minute, disposed in a loose cyme; pedicels slender: fruit naked, somewhat fleshy. — *Diag. Pl. Nov. pars tertia*, p. 53, & *Biol. Cent.-Am. Bot.* ii. 64. — Mexico, *Liebmann*, no. 220.

+ + + Leaves (1.5 cm. or less in length) linear-oblong to elliptic-oblong, cuspidate-acuminate: fruit subcarneous or distinctly baccate.

+ + Inflorescence terminating the stems and branches in few-flowered cymes: fruit subcarneous.

21. *G. Galeottianum*, WALP. Perennial nearly glabrous throughout, slightly hispid on the stems below: stems slender, reclining or ascending, 3 to 15 dm. long: leaves in fours, linear-oblong to oblong-

ovate, 5 to 10 mm. long, 1 to 4 mm. broad, acuminate, glabrous or slightly hispidulous on the margins, elongate-glandular-punctate beneath, and with a cluster of glands below near the tip: flowers brownish purple; lobes of the corolla cuspidate-attenuate. — Rep. vi. 17. *G. uropetalum*, Hemsley, Biol. Cent.-Am. Bot. ii. 66, & v. t. xli. f. 7-9. *Rubia acuminata*, Mart. & Gal. Bull. Acad. Brux. xi. 1, 127. — Southern Mexico, Galeotti, nos. 2631, 2632; Oaxaca, Sierra de San Felipe, altitude 3072 m., Pringle, no. 4710, vicinity of La Parada, altitude 2300 to 2700 m., E. W. Nelson, no. 1015.

→ → Flowers axillary or mostly terminating the branches in pairs: fruit distinctly baccate.

22. *G. Aschenbornii*, SCHAUER. Perennial, many stemmed from the base: stems reclining or ascending, 3 to 5 dm. or more in length, glabrous or minutely hispidulous: leaves in fours, linear-oblong to elliptic-oblong, occasionally somewhat oblong-lanceolate, 0.5 to 1.5 cm. long, 2 to 5 mm. broad, acute, or cuspidate-acuminate, oblong-punctate beneath with a large gland or cluster of glands on the lower surface near the apex, glabrous or hispidulous on the margins: flowers at least in the dried state a greenish yellow; lobes of corolla cuspidate-acuminate: pedicels glabrous, in fruit 2 to 6 mm. in length: mature fruit about 5 mm. in breadth. — Linnæa, xx. 701. *G. geminiflorum*, Mart. & Gal. Bull. Acad. Brux. xi. 1, 126; Walp. Rep. vi. 17; Hemsley, Biol. Cent.-Am. Bot. ii. 64, & v. t. xli. f. 1-3. — Valley of San Luis Potosi, Schaffner, no. 841; Zimapan, Th. Coulter, no. 189; Jalisco, volcano of Colima, Marcus E. Jones, no. 218; Federal District, under pines, base of Sierra de Ajusco, altitude 2460 m., Pringle, no. 6597; Orizaba, Müller, no. 1444, Galeotti, no. 2604, and according to Hemsley, Liebmann, no. 236; Guatemala, Donnell Smith, no. 1970, Heyde & Lux, no. 3975 (of Donnell Smith's sets), the latter distributed as *Relbunium hypocarpium*, Hemsl., and according to Hemsley, Biol. Cent.-Am. Bot. l. c., Bernoulli, no. 292.

\* \* More or less suffruticose plants, hirsute-pubescent throughout: leaves in whorls of four to seven.

— Stems 5-7-angled.

23. *G. angulosum*, GRAY. Fruticose: stems 5-7-angled, covered below with a grayish bark; branches divaricately spreading, hirsute-pubescent especially on the angles: leaves in whorls of four to seven, linear-oblong or somewhat elliptic-oblong, 6 to 10 mm. long, 2 to 4 mm. broad, acute, slightly cuspidate-acuminate, hirsute-pubescent on the



upper surface and on the prominent midrib beneath, margins ciliate: flowers axillary or terminating the stems and short lateral branchlets: corolla glabrous, greenish white; lobes broadly oblong-ovate, acute: pedicels of the young fruit nearly 2 mm. in length, somewhat thickened, glabrous or sparingly hirsute: immature fruit glabrous, seemingly baccate. — Proc. Am. Acad. xi. 74, 115. — Guadalupe Island, off Lower California, *Palmer*, no. 36.

← ← Stems 4-angled.

24. *G. pubens*, GRAY. A stout herbaceous perennial: stems apparently becoming somewhat indurated at the base: leaves in fours or rarely in fives, broadly ovate, ovate-oblong or oblong-linear, 5 to 15 mm. long, 2 to 8 mm. broad, acute or shortly subacuminate, hirsute-pubescent on either surface, the scattered hairs of the upper surface often curved or subuncinate, margins slightly hispid: flowers axillary or cymose: pedicels recurved, pubescent: immature fruit minutely pubescent, distinctly baccate: male plants more profusely flowered. — Proc. Am. Acad. vii. 350, Bot. Cal. i. 285, & Syn. Fl. N. A. i. pt. 2, 40. — California, *Bolander*, no. 6346, *Torrey*, no. 188; Lower California, near Encenada, 12 April, 1882, *Marcus E. Jones*, also from Lower California, collected by *Orcutt* in 1883, without number.

§ 4. Species of doubtful affinity.

25. *G. ? denticulatum*, BARTL. Stems diffusely branching, hispidulous-setose: leaves in fours, ovate, cuspidate, remotely dentate-ciliate, subhirsute upon either surface, 1-nerved: flowers few, terminating the stems, usually in threes: pedicels capillary: fruit glabrous? — In DC. Prod. iv. 612; Hemsley, Biol. Cent.-Am. Bot. ii. 64. — Mexico, Real del Monte, *Hænke*. Specimens not seen. Description compiled from De Candolle's Prodrömus.

**RELBUNUM**, Endl. (Name a Latinization of *relbun*, which Feuillée states to be the vernacular for a Chilian dye plant, the *Relbunium hypocarpium* of Hemsl.) — Flowers perfect, subtended by a 2-4-bracteate involucre. Calyx-tube globose; limb obsolete. Corolla rotate, 4-lobed; lobes valvate. Stamens 4, exserted, adnate to the tube of the corolla; filaments short; anthers dithecal. Ovary 2-celled; styles 2, free or connate at the base; stigmas capitate; ovules solitary in the cells, borne on the dissepiment, amphitropous. Fruit didymous, more or less fleshy or baccate, smooth and glabrous, or hirsute, usually two- or by absorption one-seeded. Seeds concave on the face: embryo curved; cotyledons foliaceous; radicle inferior. — Herbaceous perennials having



the habit, flowers, and foliage of *Galium*, but with the leaves in whorls of four, axillary inflorescence, involucre flowers, and usually fleshy fruit. — Gen. Pl. 523 (as a section under *Galium*); Benth. & Hook. f. Gen. ii. 149; Schumann in Fl. Bras. vi. pt. 6, 103; Engl. & Prantl, Nat. Pflanzenf. iv. Ab. 4, 154. *Galium* § *Relbunium*, Gray, Syn. Fl. N. A. i. pt. 2, 40, in part.

§ 1. Involucre of two bracts: fruit pedicellate.

1. *R. sphagnophilum*. A slender delicate annual, pale green, glabrous throughout: stems reclining, rooting at the nodes; internodes 2 to 12 mm. in length: leaves ovate-elliptic, 2 mm. long, one half to two thirds as broad, acute, narrowed below into a subpetiolate base: peduncles axillary, solitary, 2-bracteate above; bracts minute, less than 1 mm. in length: corolla not seen: fruit baccate, glabrous, about 1 mm. in breadth. — Collected by C. G. Pringle in sphagnum on the Sierra de Clavellinas, Oaxaca, altitude 2770 m., 17 October, 1894, no. 5812. Probably a near relative of the South American *R. humile*, Schumann.

§ 2. Involucre of four bracts: fruit sessile or nearly so.

\* Leaves elliptic to obovate: plant hirsute-pubescent.

2. *R. hypocarpium*, HEMSL. Annual: stems 1 to 10 dm. long, pilose: leaves membranous, 5 to 15 mm. long, 3 to 8 mm. broad, rounded and usually obtusely mucronate at the apex, entire, ciliate, slightly narrowed at the base, pubescent upon either surface, dark green above, paler beneath: peduncles 5 to 15 mm. long: bracts of the foliaceous involucre ovate, acute or obtusish, narrowed into a subpetiolate base: flowers sessile; lobes of the corolla ovate, acutish, ciliate: fruit black or reddish, hirsute. — Biol. Cent.-Am. Bot. ii. 63. *R. hypocarpium*, Schum. Fl. Bras. vi. pt. 6, 112, t. 92. *Rubia hypocarpia*, DC. Prodr. iv. 591; *Valantia hypocarpia*, L. Syst. Nat. ed. 10, 1307. *V. hypocarpa*, L. Spec. ed. 2, ii. 1491. — Jalapa, C. L. Smith, no. 1570; Mirador, Liebmann, no. 225; Orizaba, Müller, nos. 1551, 1699, *Sumichrasti*, no. 468; Oaxaca, Pringle, no. 5629; Guatemala, von Türckheim (no. 721 of Donnell Smith's sets).

\* \* Leaves ovate-oblong to oblong-lanceolate: plant glabrous.

3. *R. lævigatum*, HEMSL. Stems cespitose, diffusely branched: leaves ovate-oblong or ovate-lanceolate: peduncles axillary: flowers sessile and solitary in the involucre: fruit glabrous. — Biol. Cent.-Am. Bot. ii. 63. *Rubia lævigata*, DC. Prodr. iv. 591 (whence above description). *Galium lævigatum*, Bartl. in DC. Prodr. iv. 591. — Collected in Mexico by Hanke. Specimens not seen.

\*\*\* Leaves lanceolate to lance-oblong, pubescent or at least ciliated; margins not conspicuously thickened.

4. *R. hirsutum*, SCHUMANN. Low prostrate many-stemmed herbaceous perennial; stems 4-angled, covered upon the somewhat thickened angles by a spreading hirsute pubescence: leaves lance-oblong, a centimeter or less in length, 2.5 to 3 mm. broad, hirsute-pubescent upon the upper surface and upon the midrib beneath, ciliate: the 1-flowered involucre solitary in the axils; their peduncles about equalling the leaves. — Fl. Bras. vi. pt. 6, 116. *Galium hirsutum*, Ruiz & Pavon, Fl. Peruv. i. 59.

The above description has been drawn from South American material, which well accords with the original characterization of the species by Ruiz and Pavon. No Mexican specimens have been seen by the writer. To this species, however, Martens and Galeotti in Bull. Acad. Brux. xi. pt. 1, 126, doubtfully refer *Galeotti's* no. 2650, collected on rocks near Mirador, Vera Cruz.

5. *R. ciliatum*, HEMSL. Low herbaceous plants: stems obtusely 4-angled, glabrous, leaves narrowly lanceolate, 1 cm. or less in length, acute, glabrous upon either surface, margin ciliate: peduncles axillary, solitary, slender, 3 to 5 mm. long; bracts of the involucre somewhat unequal, narrowly lanceolate, acute, ciliate: flowers sessile: fruit glabrous. — Biol. Cent.-Am. Bot. ii. 62. *Galium ciliatum*, Ruiz & Pav. Fl. Peruv. i. 59. *G. involucreatum*, HBK. Nov. Gen. & Spec. iii. 335. *Rubia ciliata*, DC. iv. 591. — South Mexico in woods of El Sabino near the city of Mexico, *Galeotti*, no. 2596, acc. to Martens & Galeotti, Bull. Acad. Brux. xi. pt. 1, 126.

The typical plant is a native of Western South America. No Mexican or Central American specimens belonging to this species have been seen by the writer.

\*\*\*\* Leaves lance-linear to linear, more rigid; margins conspicuously thickened.

6. *R. microphyllum*, HEMSL. Glabrous throughout: stems rising from a perennial base, erect or nearly so, 1 to 3 dm. high, much branched above; branches obtusely 4-angled, faces somewhat furrowed: leaves 5 to 15 mm. long, usually pungent-tipped; margins revolute, thickened, smooth: peduncles axillary, solitary: bracts of the involucre similar to the leaves but smaller: flowers sessile; corolla-lobes ovate, obtusish: fruit glabrous or rarely slightly granulose, sessile or short-pedicellate. — Biol. Cent.-Am. Bot. ii. 63. *Galium microphyllum*, Gray, Pl. Wright. i. 80 & Syn. Fl. N. A. i. pt. 2, 41. — New Mexico, *Wright*, nos. 234,

420, 1111, Pinos Altos Mts., *Greene*, no. 145; Arizona, ravines about Camp Grant, 23 April, 1867, *Palmer*, no. 106, banks south of Camp Apache, *Rothrock*, no. 271, Santa Catalina Mts., and at Ft. Bowie, *Lemmon*, no. 127, also on Santa Catalina Mts., altitude 770 to 925 m., 17 April, 1881, *Pringle*, *Lemmon*, no. 527; Texas, El Paso, *Thurber*, nos. 179, 1118, at Belknap, *Sutton Hayes*, no. 327; N. W. Mexico, *Seemann* (without number); Sonora, about Hermosillo, *Crawford*, 1888; S. W. Chihuahua, August to November, 1885, *Palmer*, no. 413; Coahuila, Mts., 14.5 km. east of Saltillo, July, 1880, *Palmer* (without number); region of San Luis Potosi, *Schaffner*, no. 842 a, and at Soledad, 40 km. southwest of Monclova, September, 1880, *Palmer*, no. 415; Morelos, at Tres Marias near Cuernavaca, altitude 2920 m., *Pringle*, no. 7233. A species on the one hand, through var. *setulosum*, approaching the South American *R. ciliatum*, Hemsl., and on the other, through the var. *hispidulum*, the Mexican *R. polyplocum*, Hemsl.

**Var. setulosum.** Leaves setulose-ciliate: fruit granulose-hispid, otherwise like the species. — *R. microphyllum*, Hemsl. Biol. Cent.-Am. Bot. ii. 63, in part. — Zimapan, *Th. Coulter*, no. 186; region of San Luis Potosi, *Parry & Palmer*, nos. 309, 310.

**Var. hispidulum.** Habit of the species proper: stem and leaves covered with a scattered short hispidulous pubescence: fruit essentially glabrous, or somewhat granulose. — *R. polyplocum*, Hemsl. Biol. Cent.-Am. Bot. ii. 63, in part. — Valley of San Luis Potosi, *Schaffner*, no. 842; region of San Luis Potosi, altitude 1850 to 2460 m., *Parry & Palmer*, no. 308. Approaching the following species in the character of the pubescence, but having a distinctly different habit.

**7. *R. polyplocum*, HEMSL.** Herbaceous, closely hispidulous-pilose throughout: stems much branched forming dense mats; branches very slender, obtusely tetragonal as in the preceding species: leaves acute or obtusish, not distinctly cuspidate-tipped: flowers solitary, sessile in the small involucre bracts: fruit sessile or nearly so, small, white-granulose or glabrous. — Biol. Cent.-Am. Bot. ii. 63. — Southern Mexico, Mirador, *Liebmann*, no. 244, and (according to Hemsley) no. 243; also *Linden*, no. 516.

***R. ASCHENBORNII*, Hemsl. Biol. Cent.-Am. Bot. ii. 62, is *Galium Aschenbornii*, Schauer, treated above.**

## II. DIAGNOSES OF NEW AND CRITICAL MEXICAN PHANEROGAMS.

*Tradescantia brachyphylla*. Stems erect, 2 to 3 dm. high, branching from the base, glabrous except along a line ascending from the axil of each leaf: internodes 2 to 5 cm. long: leaves sessile, ovate-oblong, 1.5 to 2 cm. long, two thirds as broad, acute, glabrous on either surface, ciliate: flowers in sessile umbels terminating the stems and branches; pedicels about 1.5 cm. long, glabrous or with a scattered pubescence: sepals oblong, navicular, 6 mm. long, obtusish, glabrous or with a few hairs on the thickened keel: petals roseate, broadly ovate, obtuse, 6 to 7 mm. long, two thirds as broad: the alternating stamens longer and shorter respectively; filaments all bearded: ovary and style glabrous; stigma subcapitate: mature capsule 3 mm. long: seeds oblong, 1.5 mm. long, rugose; embryotega dorsal. — Collected by C. G. Pringle on dry limestone ledges near Tehuacan, altitude 1538 m., 29 July, 1897, no. 6679.

*TRADESCANTIA HOLOSERICEA*, Kunth, Enum. Pl. iv. 92. Specimens collected by Rev. Lucius C. Smith in the Clavellinas, State of Oaxaca, altitude 2770 m., 26 June, 1894, no. 66, and also by C. Conzatti and V. González on the Cerro de San Felipe, altitude 3000 m., 25 July, 1897, no. 229, but for the larger leaves agree in all essential details with Kunth's excellent description of the above species. The leaves in the specimens at hand are sessile, ovate-oblong, acuminate, 6 to 20 cm. long, 2.5 to 8.5 cm. broad. The flowers are violet or purple, and the bracts also are often more or less colored.

*Tradescantia longifolia*. *Dichorisandra longifolia*, Mart. & Gal. Bull. Acad. Brux. ix. 378 (reprint p. 7). Excellent specimens of this species from Southern Mexico, and agreeing well with the original description of Martens and Galeotti, prove to be quite distinct from *T. holosericea*, Kunth, under which species the plant under consideration has been placed as a variety. The following description may be appended: — roots fascicled, tuberous: stems erect or nearly so, 2 to 5 dm. high, simple or sparingly branched from near the base: leaves lance-attenuate, 10 to 15 cm. long, 1.5 to 3 cm. broad, villous-pubescent upon either surface, strongly ciliate, especially about the margin of the sheath: inflorescence an open oblong racemose panicle: flowers (in the dried state) 12 to 13 mm. in breadth: sepals oblong, 5 to 6 mm. long, rounded at the apex: the roseate petals obovate, slightly exceeding the calyx: stamens equal or nearly so; filaments strongly bearded: ovary glandular-

pubescent above: mature capsule 6 mm. long: seeds rugose. — Collected by Rev. Lucius C. Smith at Cuatro Venados, altitude 2150 m., 27 June, 1894, no. 64; by C. G. Pringle on hills above Oaxaca, altitude 1840 m., 6 August, 1894, no. 5608, and in the same locality, 15 July, 1897, no. 6711.

The species is readily distinguished from *T. holosericea*, Kunth, by the narrower long-attenuate leaves and by the roseate flowers.

**Tradescantia macrophylla.** Stems 4 to 6 dm. high, pubescent: leaves lance-attenuate, 15 to 25 cm. long, 3 to 4 cm. broad, pubescent upon either surface, ciliate; sheaths about 2 cm. long, somewhat inflated, veiny, more or less pubescent: inflorescence a terminal sparingly branched, villous-pubescent panicle, 8 to 22 cm. long; the lower divisions of the panicle 7 to 10 cm. long: flowers sessile or nearly so, in clusters of 3 to 5 flowers each: calyx glandular-pubescent: sepals navicular, oblong, nearly 5 mm. long, rounded at the apex, 3-nerved, margins scarious: petals equalling or slightly exceeding the calyx, white, streaked with brownish veins, or in the bud pale blue, marcescent: ovary glandular-pubescent above: capsule 5 mm. long: seeds rugose, 3 mm. long. — Collected by C. G. Pringle on bluffs of a barranca near Cuernavaca, 26 July, 1896, no. 7224, and in the same locality, altitude 1538 m., 21 August, 1897, no. 6695.

A well marked species, readily recognized by the long leaves, the close inflorescence, and the white or whitish flowers.

**Anthericum platyphyllum.** ? *Trachyandra echeandioides*, Schlecht. Bot. Zeit. iii. 629, not *A. echeandioides*, Bak. Roots fascicled, fleshy-fibrous, 1 to 2 dm. long: caudex erect, 1 dm. or more high, surrounded by a rather dense envelope of brownish fibres, the remnants of earlier leaves: leaves basal, narrowly lance-attenuate, 1.5 to 4 dm. long, 12 to 24 mm. broad, pale or livid green, glabrous on either surface with an inconspicuous semi-transparent hirtellous margin: peduncle about 4 dm. high, glabrous, terete, unibracteate, branching above into a racemose paniculate glabrous inflorescence, lateral branches of the panicle 3 dm. long: flowers 2 to 4 in the axils of short scarious bracts: pedicels 3 to 12 mm. long, much exceeding the bracts, glabrous, jointed just below the middle: perianth yellow, 2 cm. broad; divisions oblong, obtuse, 10 to 12 mm. long, 3-nerved, the inner slightly larger: stamens equal; filaments muricate; anthers oblong-linear, about 3 mm. long: capsule oblong, triangular, 1 cm. long, strongly reticulate-nerved: seeds angulate, black. — Collected by C. G. Pringle on dry limestone ledges near Tehuacan, altitude 1540 m., 29 July, 1897, no. 6680.

**Zephyranthes Konzattii.** Bulbs globose, 2 to 2.5 cm. in diameter, covered with dark brown scales; neck about 2 cm. long: leaves produced after the flowers: peduncle about 15 to 18 dm. long: spathes 2.5 to 3 cm. long, tubular below; valves lance-attenuate: pedicel slender, 3 to 4.5 cm. in length: perianth, in the dried state, rose-colored or crimson-purple in the bud, 5 to 7 cm. in length; tube short, 6 to 8 mm. long, with a lacerated ring in the throat; divisions oblanceolate, 1 to 1.5 cm. broad: stamens of two lengths, the alternating ones longer and shorter respectively, declinate; anthers strongly lunate: the declinate style exceeding the stamens; stigmas deeply 3-cleft; lobes revolute: fruit not seen. — Collected by Professor C. Konzatti, Valley of Oaxaca, altitude 1550 m., 19 April, 1896, no. 98.

A species in some respects corresponding to the description of the little known *Z. lilacina*, Liebm., but with pedicels much shorter than are attributed to that species.

**Zephyranthes Nelsonii.** Bulbs ovate, 1 to 2 cm. in diameter, covered with dark brown scales; neck 1.5 to 2.5 cm. long: leaves developed with the flowers, 5 to 15 cm. in length, 2 mm. or less wide, glabrous, obtuse: scape 5 to 12 cm. high: 1-flowered spathe 15 to 18 mm. long, scarious, often tinged with a pale rose color, tubular for about two thirds its length, bifid above, the divisions lance-attenuate: pedicel 12 to 20 mm. in length: perianth narrowly funnelform, white with a very slight tinge of rose, about 2.5 cm. high; tube slender, 6 to 7 mm. in length; divisions oblanceolate, 6 to 7 mm. broad, strongly nerved: stamens nearly equal, about two thirds as long as the perianth; anthers 4 to 5 mm. long: style overtopping the stamens; stigmas shortly 3-lobed: capsule about 5 mm. high, nearly twice as broad, glabrous. — Collected by E. W. Nelson, near Santa Domingo, Oaxaca, altitude 500 m., 18 June, 1895, no. 2711 a; also between San Ricardo and Ocozucantla, Chiapas, altitude 800 to 1000 m., 18 August, 1895, no. 2983.

A species with much the habit of *Z. texana*, Herb., but with a much longer more pronounced perianth-tube, and less divided stigmas. Our plant may eventually prove to be the same as the *Z. Lindleyana*, Herb., but the flowers are somewhat smaller than are ascribed to that species in the original description, and certainly our plant does not well accord with the description of *Z. Lindleyana*, Herb., as drawn by Baker in his Handb. Amaryll. 32.

**COOPERIA DRUMMONDI**, Herb. acc. to Lindl., Bot. Reg. t. 1835. Specimens agreeing in all essential details with the above species were collected by the late Rev. Lucius C. Smith, at Peña de Ejutla, Nacalte-



pec, in the State of Oaxaca, altitude 2000 m., 1 June, 1895, no. 545; also by C. Conzatti near the city of Oaxaca, altitude 1550 m., 17 May, 1896, no. 146.

This species has been hitherto attributed to Northern Mexico and Texas.

*FURCRAEA BEDINGHAUSII*, Koch. Wochenschr. 1863, 233; Morr. Belg. Hort. xiii. 327, with fig.; Baker, Handb. Amaryll. 203, & Bot. Mag. t. 7170. To this species may be referred Pringle's no. 6669, collected on lava beds, Serrania de Ajusco, altitude 2600 m., 17 August, 1897, distributed as "*Yucca Pringlei*," a name given to the plant from fruiting specimens only. Early in the present season Mr. Pringle was successful in securing flowering specimens, which proved beyond a doubt that the affinity of the plant is with the genus *Furcraea*, and not with *Yucca*.

Through the kindness of Mr. J. G. Baker, of the Royal Gardens, Kew, Mr. Pringle's plant (notwithstanding its somewhat smaller leaves) has been identified with the above species.

*CORALLORHIZA INVOLUTA*. Aphyllous, glabrous throughout, the entire plant purplish: roots coralloid: stems 1 to 2.5 dm. high, provided with three sheathing obtuse bracts: racemes few—several-flowered: floral bracts short: perianth purple, about 12 mm. in diameter; sepals oblong, somewhat narrowed toward the apex, 6 mm. long, about one third as broad, 3-nerved, the lateral sepals a little unequal at their bases forming a slight gibbosity: petals oblong, obtuse, 3-nerved, nearly equalling the sepals: labellum deep purple with a yellowish base, oblong, thickened, 6 mm. long, about one half as broad with an obtuse blunt almost truncate apex, provided near the base with a thick cushion-like body, margins strongly involute: clinandrium somewhat arched, about 3 mm. long.—Collected by C. G. Pringle under oaks on the summit of Sierra de San Felipe, Oaxaca, altitude 2925 m., 16 June, 1894, no. 5874.

This may possibly prove to be the same as the *C. bulbosa*, Rich. & Gal., but the base of the plant is not bulbous, and there is no correspondence with the character "*hinc et illinc lobulo obtuso aucto*."

*CORALLORHIZA MEXICANA*, Lindl. Gen. & Sp. Orch. 534. Specimens collected by Mr. C. G. Pringle on the Sierra de San Felipe, Oaxaca, altitude 2750–3000 m., June, 1894, no. 4690, also in the same locality by C. Conzatti and V. González, 12 September, 1897, no. 461, are referred doubtfully to the above species. In view of the very meagre descriptions of the Mexican species of this genus, it seems advisable to append the following description of the specimens in question.



Plant glabrous throughout, aphyllous: stems from an ascending rhizome, 3 to 7 dm. high, purplish, provided with 2 to 4 sheathing obtuse or acutish somewhat scarious nerved bracts: racemes many-flowered; rhachis subangulate; floral bracts small, scarious: perianth 1.5 cm. broad, yellowish white or purplish in the dried state, pedicellate, at first erect, later reflexed; the persistent sepals about 7 mm. long, nearly 3 mm. broad, obtuse, 3-nerved, the upper oblong the lateral oblong-lanceolate, slightly oblique, prolonged at the base into a short gibbous adnate spur; petals oblong, obtuse, often somewhat oblique, 3-nerved, a little shorter than the sepals; labellum 6 to 7 mm. long, yellowish white, dotted with purple, short-unguiculate, 3-lobed, 3-nerved from the base, lateral lobes short, somewhat falcate, obtuse, rounded or sometimes emarginate, the median lobe obovate-cuneate, subtruncate or retuse, entire, occasionally irregularly crenate, bilamellate at the base on either side of the midnerve, between the lateral sinuses, rather densely papillate on the upper surface, 5-nerved from the branching of the two lateral nerves just above the sinus on either side: clinandrium somewhat arched, about 5 mm. long: capsule oblong-obovoid, 12 to 17 mm. long, reflexed. A species as stated by Lindley "very like *C. multiflora*," but differing in the lobing of the lip, the papillate character, and the venation of the same, as well as the shorter lamellæ.

**Corallorhiza Pringlei.** Glabrous throughout, aphyllous: stems slender, 1 to 3.5 dm. high, more or less scaly-bulbous at the base; caudex provided with 1 to 3 sheathing bracts: racemes rather few-flowered; floral bracts minute, shorter than the pedicels, the latter 2 to 3 mm. in length: flowers small, 5 to 8 mm. in breadth when fully expanded; sepals oblong-lanceolate, obtuse, inconspicuously 3-nerved, 3 to 4 mm. long, about 1 mm. broad, exceeding in length the obtuse slightly broader lateral petals, both sepals and lateral petals marked with a semi-translucent oblong punctation; lip white variegated with purple, ovate-rotund or sometimes slightly obovate-rotund, narrowed at the base into a short claw, strongly emarginate at the apex, with an irregular crenate margin, 3-5-nerved, bearing two somewhat diverging lamellæ about one third distant from the base; clinandrium short, thick, about 2 mm. long: capsule oblong-elliptic, 7 mm. long, reflexed on slender pedicels. — Collected by C. G. Pringle on shaded banks, Las Sedas, Oaxaca, altitude 2000 m., 1 November, 1894, no. 5804; and on the Sierra de San Felipe, altitude 2600 m., 13 December, 1895, no. 6295.

Distributed in 1895 as *C. Mexicana*, Lindl., from which it is distinguished by the more slender habit, smaller flowers, and by the well marked characters of the lip.

*EPIDENDRUM ELEGANS*, Rehb. f. in Walp. Ann. vi. 374. *Barkeria elegans*, Knowles & Wescott, Fl. Cab. ii. 7, t. 49. This rare and beautiful orchid has been rediscovered by Mr. Pringle on limestone ledges near Tehuacan, altitude 1540 m., 31 July, 1897, no. 6769.

The species is readily recognized by its upright leafy stem, terminal racemose inflorescence, long bracteate-sheathed peduncle, and finally by the beautiful lilac-purple flowers (3-5 cm. broad), and the oblong usually undivided lip, which is adnate to the base of the column for one fourth the length of the latter organ.

*CELTIS MONOICA*, Hemsl. Biol. Cent.-Am. Bot. iii. 139, v. t. 77. Excellent fruiting specimens of this species were collected by Mr. E. W. Nelson on Maria Madre Island of the Tres Marias group of islands, 3-25 May, 1897, no. 4236. The leaves in Mr. Nelson's specimens are more distinctly serrate than in the type, but they have exactly the same outline, venation, and pubescence. The following description of the fruiting characters may be appended:—pedicels axillary, solitary, ascending or erect, 1 cm. or less in length, appressed-puberulent: mature fruit oblong-ovate, 10 to 12 mm. long, 6 to 8 mm. thick, subtriangular, glabrous: the undivided styles persistent.

The above species is readily recognized on account of the distinctly pinnate venation of the leaves, while in most of the species of the genus the leaves are 3-nerved from the base.

*Pouzolzia Pringlei*. Shrub: stems and branches covered with a grayish brown bark, dotted with scattered lenticels; the branchlets pubescent: leaves oblong-ovate or elliptic-ovate, 1.5 to 4 cm. long, 10 to 18 mm. broad, obtuse or acute, entire, ciliate, 3-nerved from the cuneate or rounded base, pubescent above, densely white-tomentose beneath; petioles pubescent, 3 to 10 mm. long; stipules triangular-acuminate, about 3 mm. long, ciliate, 1-nerved, pubescent on the outer or lower surface: flowers monœcious, disposed in dense axillary clusters: staminate flowers, 3-4-merous: the short bidentate perianth of the fertile flowers much exceeded by the long prominent style; fruiting perianth ovate, short-acuminate, about 2 mm. long, pubescent, somewhat tuberculate-winged, completely enclosing the ovate acute smooth white shining akene.—Collected by C. G. Pringle in Tomellin Cañon, altitude 1230 m., 9 July, 1897, no. 6736.

A species somewhat resembling *P. nivea*, Watson, but with oblong leaves and shorter stipules.

*Ruprechtia Pringlei*. Shrub or small tree 4 to 6 m. high: stems and branches terete, smooth, covered with a grayish bark: leaves oblong-

ovate or slightly obovate, 4 to 7 cm. long, 2 to 3.5 cm. broad, abruptly acuminate to an obtusish apex, entire or somewhat repand, narrowed at the base to a short petiole, glabrous above except on the puberulent midrib, pubescent below, the midrib and veins prominent on the lower surface, nerves not strongly reticulated: petioles barely 3 mm. in length: ochræ about 2 mm. long, deciduous: fruiting calyx 2.5 cm. long; tube 4 mm. long; inner divisions of the calyx small, linear, acute: akene narrowly ovate-acuminate, glabrous below, above bearing a trace of pubescence on the acute angles, the lower portion triangularly 3-lobed with shallowly furrowed lobes and rather deeply sulcate faces. — Collected by C. G. Pringle in Tomellin Cañon, Oaxaca, altitude 925 m., 7 December, 1895, no. 7008.

A species in general aspect similar to *R. fusca*, Fern., but with differently outlined and less reticulately veined leaves, smaller fruiting calyx, and essentially glabrous akene.

**Iresine discolor.** Shrub: stems terete, covered with a grayish bark and often dotted with numerous lenticels, the ultimate branches finely tomentose, somewhat compressed at the nodes: leaves opposite, petiolate, ovate-lanceolate, elliptic-lanceolate, or sometimes ovate, acute, 1 to 5 cm. long, 5 to 20 mm. broad, usually strongly discolorous, finely pubescent or even tomentose and granulose above, densely soft-tomentose beneath, acute or obtusish at the apex, margin entire, narrowed at the base into a short pubescent petiole; petioles 3 to 6 mm. long: inflorescence of rather small panicles terminating the branches; the branches of the panicles bearing pedicelled spikelets with tomentose rachises; bracts scarious, broadly 1-nerved, ovate, obtusish: flowers diœcious: staminate flowers about 2 mm. long; divisions of the calyx scarious, oblong-elliptic, obtuse; stamens united at the base into a short cup, the 5 staminodea two thirds as long as the filaments, hirtellous; the rudimentary ovary with sessile shortly 2-lobed stigmas: pistillate flowers about 2 mm. long; calyx divisions elliptic-lanceolate, acutish, distinctly 1-nerved, with scarious margins; ovary glabrous; styles short with 2 (to 3) long slender stigmas. — Collected by C. G. Pringle and C. Conzatti in Santa Catarina Cañon, altitude 1000 m., 4 July, 1897, Conzatti's no. 231; also by C. G. Pringle in Tomellin Cañon, altitude 1230 m., 4 July, 1897, no. 6713, and in the same locality, altitude 1000 m., 17 May, 1894, no. 5787. The latter number, although differing slightly in foliar characters, has the same floral structure, and is said by Mr. Pringle to be the same as no. 6713.

BATIS MARITIMA, L. Syst. Nat. ed. 10, 1176. This species, not

hitherto definitely known to occur in Mexico, has been collected by Mr. Nelson on Maria Magdalena Island of the Tres Marias group of islands, 26-28 May, 1897, no. 4327.

*THELYPODIUM LONGIFOLIUM*, Watson, Proc. Am. Acad. xvii. 321. To this species may be referred Pringle's no. 6548, from the Valley of Mexico, 30 September, 1896, distributed under *T. micranthum*, Watson, and later described by Professor Edward L. Greene, Pittonia, iii. 247, as *T. anisopetalum*.

*ERYSIMUM MACRADENIUM*, Gay, Erys. Nov. 8. Excellent specimens of this interesting species, both in flower and fruit, were collected by C. Conzatti and V. González on the summit of the Sierra de San Felipe, Oaxaca, 15 August and 26 September, 1897, no. 499. The species is well marked by the large placental glands, and by the long capsules (15 to 16 cm. in length).

*Phyllanthus subcuneatus*. Suffrutescent, about 1 m. high, glabrous throughout: stems and branches covered with a grayish bark, the younger shoots reddish: leaves alternate, often subfascicled, petiolate, obovate, obovate-cuneate or distinctly cuneate, 3 to 10 mm. long, two thirds as broad, rounded, subtruncate or retuse at the apex, entire, somewhat paler beneath; petioles 1 to 1.5 mm. long; stipules minute, about 1 mm. in length: flowers axillary: staminate flowers about 3 mm. broad, short-pedicellate; pedicels 1 to 4 mm. long: calyx 6-parted; divisions oblong or oblong-ovate, rounded at the apex, 1-nerved, margins scarious: stamens monadelphous; anthers 3 at the top of the column; glands 6, distinct: pistillate flowers 3 to 4 mm. broad, on slender pedicels, 6 to 9 mm. long: calyx 6-parted; the divisions obovate, rounded or obtusish at the apex, green; the disk cupulate, 6-lobed: ovary glabrous; styles united at the base only, spreading; stigmas slightly 2-lobed: capsule about 3 mm. in diameter, slightly broader than long: seeds triangular, about 2 mm. long, with a reddish brown minutely roughened surface.—Collected by C. G. Pringle on limestone ledges near Tehuacan, altitude 1540 m., 29 July, 1897, no. 6753.

*Argythamnia neo-mexicana*, Müll. Arg., var. *depressa*. Stems numerous, prostrate from a woody perennial base: leaves oblanceolate, 2.5 to 4 cm. long, about 8 mm. broad, narrowed below into a subpetiolate base, glabrate: calyx-divisions of the fertile flowers a little shorter and somewhat less acuminate than in the type: seeds conforming to the species proper.—Collected by C. G. Pringle on calcareous plains of Tehuacan, altitude 1540 m., 29 July, 1897, no. 6752.

*EUPHORBIA LACERA*, Boiss. Euph. Cent. 22, & Euph. Ic. t. 30. A

number of specimens of this species at hand show the foliage to be extremely variable. The leaves are ovate, elliptic-oblong to linear, 2 to 12 cm. long, 2 to 18 mm. broad, deeply incised-dentate (especially toward the base) to entire, usually with one or two larger divaricate triangular teeth at the base of the blade, which give the leaves a halberd-shaped appearance. The bicornute greenish appendages of the four glands of the involucre and the tetragonal seeds associated with the dichotomously branching glabrous stems, notwithstanding the strongly polymorphous character of the leaves, readily distinguish this species from *E. heterophylla*, L., with which it has been confused. The following specimens may be referred to *E. lacera*: Valley of San Luis Potosi, Schaffner, no. 859 (in the Gray Herbarium under *E. heterophylla*, L., var.); Sierra de San Felipe, Oaxaca, altitude 2300 m., 11 September, 1894, Pringle, no. 5619; at El Parin, Oaxaca, altitude 1230 m., 3 October, 1894, Pringle, no. 5707; also Pringle's no. 6685, collected on limestone hills near Tehuacan, altitude 2000 m., 30 August, 1897.

*EUPHORBIA PROSTRATA*, Ait. Hort. Kew. ed. 1, ii. 139. To this species may be referred Pringle's no. 6436, *Euphorbia ramosa*, Seaton, var. *villosior*, Greenman, Proc. Am. Acad. xxxii. 297, also Pringle's no. 6683, collected on dry limestone ledges, Tehuacan, altitude 1540 m., 27 August, 1897; both specimens correspond well with Parry and Palmer's no. 818, Karwinski's specimen from Mexico without further data, and also with other authentic material.

The *E. ramosa*, Seaton (Proc. Am. Acad. xxviii. 121), is very closely allied to, if not specifically the same as *E. prostrata*, Ait., differing only in the glabrous capsules, and the less villous character of stem and leaves. The mature seeds in all the specimens mentioned above are grayish, subquadrangular, somewhat furrowed, more or less transversely rugose, and distinctly foveolate or honeycombed. The less mature seeds are more apt to be reddish, and more distinctly furrowed.

*Euphorbia (Alectorocitonum) tricolor*. Suffrutescent, 1 m. or less in height: stems and branches covered with a grayish red bark, somewhat striated, puberulent on the young shoots; nodes 1 to 6 cm. distant: leaves petiolate, ternate, quaternate, or the uppermost opposite, oblong-ovate, 1 to 2 cm. long, two thirds as broad, glabrous above, sparingly pubescent beneath, rounded at the apex, entire, cuneate at the base; petioles pubescent, 4 to 8 mm. long; stipules glandular: inflorescence in terminal usually close cymes: involucre wine-colored or sometimes greenish, strigillose-pubescent on the outer surface, also pubescent within; lobes laciniate; glands subbilabiate, bearing oblong-ovate entire



or slightly toothed showy appendages, these on the outer surfaces at the base a deep wine color, above which is an area of purple or deep rose color, and this again tipped with white: ovary rather long-stiped, glabrous; styles bifid, about three fourths free, somewhat thickened: capsule obtusely triangular, 6 mm. long, 5 to 6 mm. in diameter: seeds ecarunculate, tetragonal, slightly roughened, 4 mm. long. — Collected by C. G. Pringle on dry calcareous bluffs near Tehuacan, 29 August, 1897, no. 6682.

*Euphorbia* (*Cyttarospermum*) *violacea*. Perennial, dichotomously branched from the base, 1 to 3 dm. high: stems and branches more or less angled and striate, glabrous or with a few scattered hairs, hispidulous at the nodes: nodes from 1 to 7 cm. distant: upper leaves opposite, the lower alternate, narrowly oblong or oblong-lanceolate, 1 to 4.5 cm. long, 2 to 8 mm. broad, glabrous or nearly so above, scattered hirtellous-pubescent beneath, acutish, entire, hispidulous on the margins, narrowed or attenuate at the base into a rather broad thickish petiole; petioles 2 to 10 mm. long; stipules glandular: inflorescence in terminal pedunculate cymes: bracts minute, pubescent: involucre turbinate, somewhat pubescent on the outside, greenish violet to almost black, with 5 oblong laciniated-truncate lobes, and 5 glands; glands oblong with oblong-rotund violet-colored white-margined appendages, 1 mm. or more in length: ovary long-stipitate, glabrous; styles 2-parted to the base: capsule obtusely triangular, 3 mm. in length, slightly broader than long; seeds ecarunculate, ovate, foveate, 2 mm. long. — Collected by C. G. Pringle on limestone hills near Tehuacan, altitude 2000 m., 30 August, 1897, no 6681.

A well marked species, readily recognized by the beautifully violet-colored involucre and glandular appendages.

*Euphorbia xylopoda*. Much branched from a woody perennial base, 2 to 9 dm. high, glabrous throughout: stems terete, subglaucous: cauline leaves alternate, the uppermost subverticillate, elliptic or oblanceolate, 1.5 to 4 cm. long, 5 to 12 mm. broad, acute or acutish, mucronate, entire, narrowed below to a short petiole, light green above, paler and almost glaucous beneath; petioles 2 to 5 mm. in length; stipules reduced to minute glands: involucre terminal, solitary, sessile, glabrous, 5-lobed, subtended by about three ovate or obovate short-acuminate much reduced more or less colored floral leaves, ciliated at the base; lobes broad, dentate-fimbriate; glands 5, oblong, sessile or nearly so, exappendiculate: ovary 3 mm. long, glabrous; style 3-parted; stigmas 2-lobed, fleshy: mature capsule depressed, obtusely triangular, about 7 mm. long,

8 mm. in diameter, glabrous: seeds oblong, 4 mm. long, smooth, carunculate. — Collected by C. G. Pringle on the hills of Las Sedas, Oaxaca, altitude 1850 m., 22 July, 1897, no. 6698.

A species belonging apparently to the section *Poinsettia* and having its affinity with *E. restiacea*, Benth., from which it is distinguished by the larger broader leaves, the broad lobes of the involucre, and by the presence of five glands.

**Buxus pubescens.** Shrub or small tree 4.5 to 8 m. high: stems and branches covered with a grayish bark; the branchlets and younger shoots provided with a soft spreading pubescence: leaves opposite or occasionally subalternate, sessile or nearly so, rhombic-ovate to oblong-ovate, 2 to 5 cm. long, 1.5 to nearly 3 cm. broad, 3-nerved, obtuse or acutish, mucronate, cuneate at the base, entire, ciliate, soft-pubescent beneath, more sparingly pubescent and glabrate above showing the reticulate venation on the upper surface: inflorescence of axillary short-pedunculate much contracted subracemose pubescent floral clusters: staminate flowers pedicellate; pedicels 3 mm. long, about twice exceeding the ovate acute bracts: calyx deeply 4-parted; divisions ovate, acute, 2 mm. long, the inner divisions slightly broader than the outer ones: the rudimentary pistil somewhat quaterfoil or X-shaped: fertile flowers about 5 mm. long, single, sessile, terminating the inflorescence; ovary glabrous: fruit not seen. — Collected on Maria Madre Island by E. W. Nelson, 3-25 May, 1897, no. 4221.

A species apparently endemic in the Tres Marias Islands, and most nearly related to the West Indian *B. pulchella*, Baill.

**Metastelma macropoda.** Stems twining, slender, terete, above as well as the branches decussately pubescent in two lines: leaves petiolate, elliptic-oblong to elliptic-lanceolate, 1.5 to 2.5 cm. long, 4 to 7 mm. broad, mucronate or simply acute at the apex, narrowed below to a rounded or obtusish base, glabrous on either surface, or slightly puberulent on the midrib above, margins ciliolate, usually revolute; petioles 2 to 4 mm. long, puberulent above, glabrous beneath: peduncles 3 to 18 mm. long, these as well as the pedicels minutely pubescent; pedicels 2 to 3 mm. long: flowers small: calyx-lobes ovate, obtuse, about 1 mm. long, margins scarious: corolla white or cream-colored, about 4 mm. in breadth; lobes elliptic-oblong, obtusish, rather closely pubescent above: column short: mature fruit not seen. — Collected by C. G. Pringle in Tomellin Cañon, altitude 1540 m., 17 July, 1897, no. 7606.

Most nearly related to *M. pedunculare*, Decne., but differing in the  
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foliar characters, smaller flowers, shorter claw, pubescence on the corolla-lobes, and also by having a shorter column.

*Gonolobus caudatus*, Gray, var. *trachyanthus*. Shrubby, 3 to 6 dm. high: leaves petiolate, lanceolate, attenuate, glabrous, 2.5 to 3.5 cm. long, 10 to 15 mm. broad: corolla distinctly puberulent above. — Collected by C. G. Pringle in Tomellin Cañon, altitude 600 m., 24 July, 1897, no. 6654.

*Ipomœa dimorphophylla*. Stems twining, purplish, more or less pubescent: leaves petiolate, ovate, 4 to 10 cm. long, 3 to 8 cm. broad, acuminate, subcordate, entire or deeply 3-lobed, lobes obtuse, mucronate, pubescent upon either surface especially on the prominent midrib, nerves, and veins beneath; petioles 2 to 5 cm. long, pubescent, often provided with two glandular organs at the base of the leaf-blade: inflorescence in axillary pedunculate 1-several-flowered cymes; peduncles green or greenish purple, 2 to 15 cm. in length, more or less pubescent; pedicels somewhat thickened, about 1 cm. long; bracts and bracteoles caducous: calyx-divisions oblong, 6 to 7 mm. long, nearly equal, the outer slightly shorter, rounded or retuse at the apex, dark brown or almost black with lighter scarious margins: corolla white, open-funnelform, about 6 cm. long: stamens included, one half as long as the corolla; filaments unequal, pilose at the base: style about equalling the stamens: mature capsule and seeds not seen. — Collected by C. G. Pringle in a barranca near Cuernavaca, 4 August, 1896, no. 7241, and in the same locality, altitude 1900 m., 23 August, 1897, no. 6658.

*Ipomœa tentaculifera*. Glabrous throughout: stems herbaceous, twining, somewhat angled: leaves cordate, entire, acuminate, mucronate, with an open sinus at the base and rounded basal lobes, 8 to 10 cm. long, 5 to 6 cm. broad: petioles 5 to 6 cm. long: peduncles 7 to 12 cm. long, 1-flowered: pedicels about 7 cm. long, much thickened: sepals nearly equal, oblong, 10 to 12 mm. long with a rounded apex and sub-scarious margins, the inner ones slightly longer, the outer covered with herbaceous tentacle-like outgrowths: corolla "violet throughout," open-funnel-form, about 7 cm. long: stamens unequal, included, about one third the length of the corolla; filaments villous-pubescent at the base. — Collected by C. G. Pringle in Tomellin Cañon, altitude 1540 m., 17 July, 1897, no. 6702.

A beautiful and well marked species readily recognized by the one-flowered peduncles, the long almost fleshy pedicels, and by the peculiar tentacle-like growths on the calyx.

*Cordia insularis*. Shrub 3 to 5.5 m. high: stems and branches

glabrous, reddish brown, conspicuously dotted with numerous whitish lenticels; the extreme branchlets covered with a hirsute pubescence: leaves scattered, elliptic-ovate or sometimes slightly obovate, 1.5 to 3 cm. long, 1 to 1.5 cm. broad, narrowed below into a short petiole, obtuse, the upper portion more or less deeply crenate-dentate, occasionally sharply toothed, entire toward the base, hispid above, spreading hirsute-pubescent beneath, especially on the midrib and veins: inflorescence capitulate; heads small (after the corolla has fallen, about 5 mm. in diameter): peduncles, during anthesis, 1 cm. or less in length, covered with a spreading hirsute pubescence: calyx 2 mm. long, 5-dentate; teeth short, acute: corolla 3 mm. long, nearly cylindrical with short recurved lobes, externally glabrous, pubescent inside along the line of the filaments: stamens included: style a little exserted. — Collected by E. W. Nelson on Maria Madre Island of the Tres Marias group of islands, 3-25 May, 1897, no. 4296.

Most nearly related to *C. cana*, Mart. & Gal., from which it is distinguished by the more spreading pubescence throughout, the more coarsely dentate and shorter-petioled leaves, and further by the somewhat shorter peduncles.

Specimens collected by Mr. Pringle on lava beds near Zapotlan, State of Jalisco, 27 May, 1893, no. 4389, distributed as *C. cana*, Mart. & Gal., may be the same, although the pubescence on the young shoots, the peduncle, and the calyx is sub-appressed. The leaves in Mr. Pringle's plant are very much reduced, yet they have the spreading pubescence of *C. insularis* rather than of *C. incana*, so that it is difficult to say from the single specimen at hand to what species it may be correctly referred. Further material of Mr. Pringle's plant is necessary for positive determination.

CORDIA SONORÆ, Rose, Contrib. U. S. Nat. Herb. i. 106. Specimens collected by E. W. Nelson on Maria Madre Island, 3-25 May, 1897, no. 4207, agree in all essential characters with the type of the above species. In Mr. Nelson's specimens, however, the leaves are nearly glabrous above, the stamens are included and the style is slightly exserted. As in the type specimen, collected by Palmer at Alaos in 1890, no. 376, the stamens are exserted and the style included, it is evident that the flowers of this species are dimorphic.

**Heliotropium axillare.** Low, caespitose, covered throughout with a stiff grayish white more or less closely appressed pubescence: stems spreading from a rather deep ligneous root: branches irregularly flattened or somewhat angled: leaves lanceolate or narrowly oblanceolate, 1 to 1.5

cm. long, 2 to 5 mm. broad, narrowed below into a short petiole, obtusish or acute at the apex, closely appressed-pubescent on either surface, margins revolute: flowers axillary, solitary, scattered along the branches from near the base: calyx-divisions lance-linear, acute, about 3 mm. long, slightly unequal: corolla when fully expanded, 8 to 10 mm. broad; tube about equalling the divisions of the calyx; lobes rounded: nutlets about 1 mm. long, slightly hirtellous on the outer upper surface. — Collected by C. G. Pringle on plains near Tehuacan, altitude 1540 m., 29 July, 1897, no. 6749.

Most nearly related to *H. Pringlei*, Rob., from which it is distinguished by the more closely appressed pubescence, the less unequal lobes of the calyx, and also by the more rounded lobes of the corolla.

*Heliotropium mexicanum*. Suffruticose: stems ascending or erect, 3 dm. or more high, usually much branched, covered below with a brownish pubescent bark, which gradually peels away from the stem, the stems above and also the branches covered with a rather dense reflexed pubescence, and with scattered ascending stiffer hairs intermixed: leaves alternate, short-petiolate, oblong-ob lanceolate to narrowly lanceolate, including the petiole 1 to 5 cm. long, 2 to 8 mm. broad, the upper surface hirsute-hispid or sub-strigose with shorter finer hairs intermixed, somewhat channelled by the sunken midrib and lateral nerves, rather densely and finely pubescent beneath with scattered hirsute hairs intermixed especially upon the raised midrib and arched lateral nerves, obtuse or acute, margin entire, revolute: petioles about 1 mm. long: inflorescence in lateral and terminal usually pedunculate false racemes, either simple or in pairs, 2 to 20 cm. in length: flowers sessile or short pedicellate, bracteate: bracts small, subulate, about 2 mm. long: calyx 3 to 4 mm. long, deeply 5-parted; divisions somewhat unequal, linear-oblong, obtuse or occasionally acutish, hirsute-pubescent: corolla white, 5 to 6 mm. long, equally broad when fully expanded, shallowly 5-lobed or pentagonal, somewhat plaited, strigosely pubescent on the outer surface; tube slightly exceeding the calyx-lobes: stamens inserted at the middle of the corolla-tube: nutlets enclosed by the persistent calyx, about 1 mm. long, hirsute-pubescent. — Collected by Prof. A. Dugès near Guanajuato in 1880 (without number); Dr. Edward Palmer, Southwestern Chihuahua, August to November, 1885, nos. 31, 98; Rev. Lucius C. Smith at Cuicatlan, Oaxaca, altitude 554 m., 24 September, 1894, no. 209, and at Las Sedas, altitude 1780 m., 27 June, 1895, no. 391; C. Alvarez, Valley of Elta, Oaxaca, September, 1895 (L. C. Smith's collection), no. 750; Dr. Edward Palmer on Iron Mountain near the city of Durango,

June, 1897, no. 141; and by C. G. Pringle on hills near Oaxaca, altitude 1700 m., 2 July, 1897, no. 6726.

A species related to *H. fruticosum*, L., and to which some of the above cited specimens have been referred, but from which it is distinguished by the reflexed pubescence in the stems and branches, the two kinds of pubescence on the leaves, and finally by the shorter flowers and more obtuse calyx-divisions. From *H. rugosum*, Mart. & Gal., it may be distinguished by the pubescent fruit, and foliar characters. Through the kindness of M. Casimir DeCandolle, to whom I am very deeply grateful for many comparisons with type material, our plant was compared with *H. Oaxacanum*, DC., from which species it is amply distinct in the form of the leaves, pubescence, and calyx.

*Ægiphila pacifica*. Shrub 2.5 to 7 m. high: stems and branches terete, covered with a grayish brown bark and dotted here and there with lenticels, glabrous: branchlets terete, somewhat compressed at the nodes, fulvous-pubescent: leaves opposite, oblong-ovate, 5 to 15 cm. long, 3.5 to 7.5 cm. broad, more or less acuminate, entire, rounded or rather abruptly narrowed at the slightly unequal base, glabrous or at least glabrate above, with scattered tawny subappressed hairs beneath especially upon the midrib and veins: petioles less than 1 cm. in length: inflorescence terminating the stems and branches in rather close paniculate cymes; peduncles, pedicels, the subulate bracts and calyx covered by a fulvous subappressed pubescence: calyx about 4 mm. long, 4-lobed; lobes broader than long, submucronate, greenish: corolla tubular, 10 to 12 mm. long, glabrous; tube somewhat amplified above; lobes oblong-elliptic, about 4 mm. long, obtuse: stamens equal or rarely unequal, exserted; filaments pubescent below, glabrous above: drupe yellow, obovoid, 8 to 10 mm. long, 6 to 8 mm. in diameter, one half or more exserted from the persistent coriaceous subcrenately lobed, cup-shaped calyx. — Collected by E. W. Nelson, on Maria Madre Island of the Tres Marias group of islands, 3-25 May, 1897, no. 4245 (in flower), and no. 4254 (in fruit).

A species related apparently to *Ægiphila brachiata*, Cham. & Schlecht., but Mr. Nelson's plant certainly does not accord with the description of this species as to the character of the pubescence and the color of the flowers.

*SALVIA ALIENA*, Greene, Pittonia, i. 157. Excellent specimens of this very well marked species of *Salvia* were secured by Mr. E. W. Nelson on Maria Madre Island of the Tres Marias group of islands, 3-25 May, 1897, no. 4247. Mr. Nelson states that the plant is an herb from

9 to 12 dm. high. The closely and incisely toothed leaves, the rather small blue flowers, a little over 13 mm. in length, render this species readily recognizable.

*Solanum marginatum*, L. f. Suppl. 147. Complete specimens agreeing in every detail with this interesting Old World species were collected by Mr. C. G. Pringle in the Valley of Mexico, 23 August, 1896, no. 7336, and at Contreras, Valley of Mexico, altitude 2400 m., 14 August, 1897, no. 6667; also by Professor A. Dugès, in "Ravin (cañada) de Esperanza à 6 km. de Guanajuato" in the summer of 1897. The species is well illustrated in Jacq. Ic. Rar. t. 45.

*Datura pruinosa*. Herbaceous: stems, at least above, covered with a fine short close pubescence: leaves ovate or ovate-oblong, 3 to 8 cm. long, one half to two thirds as broad, repand-dentate, acute or obtusish at the apex, unequal at the base, puberulent on the upper surface, pruinose-pubescent beneath: petioles 1 to 4 cm. long, pubescent: flowers erect, pedicellate: pedicels during anthesis 4 to 8 mm. long, later becoming slightly elongated and reflexed: calyx tubular, 5-lobed, 3 to 4 cm. long, densely pubescent especially toward the base; lobes ovate-lanceolate, acute, somewhat unequal: corolla white, 5 to 6 cm. long, glabrous or nearly so; lobes tipped with a slender acumination: stamens included; filaments glabrous, adnate to the corolla-tube for one half its length: capsule pendulent on the reflexed pedicels, subglobose or slightly ovate-oblong, about 3 cm. long, armed with short slender prickles, these as well as the surface of the capsule finely pubescent: seeds oblique, light brown, pitted. — Collected by Rev. Lucius C. Smith, Cuicatlan, Oaxaca, altitude 550 m., 16 October, 1894, and 7 October, 1895, no. 943; also by C. G. Pringle, Valley of Oaxaca, altitude 1540 m., 8 July, 1897, no. 6732. A species readily recognized by the small flowers, and the fine close pruinose pubescence of the young leaves and the tips of the young branches. Most nearly related to *D. Metel*, L.

*Distictis laxiflora*. *Pithecoctenium laxiflorum*, DC. Prodr. ix. 195. Having at hand numerous and perfect specimens of the above species, it is evident, from the fruiting characters, that its affinity is with the genus *Distictis* rather than *Pithecoctenium*. To DeCandolle's excellent description, drawn, however, from a flowering specimen only, may be appended the following: — climbing: flowers, even in the same specimen, from 4 to nearly 10 cm. long, purple or violet: capsules ovate-oblong or lance-oblong, narrowed at either end, in the dried state 7 to 9 cm. long, about 4 cm. broad, often slightly curved, smooth, glabrate, longitudinally ridged along the midrib and margins of the valves, mar-



ginicidally septifragal, the valves falling away from the replum; seeds in several (4 or more) rows. — Collected by Professor A. Dugès, Guanajuato, 1893-1894, no. 111; Mrs. D. H. Sheldon, Lilos, Guanajuato, April, 1893, no. 52; Rev. Lucius C. Smith at Jayacatlan, Oaxaca, 3 June, 1894, no. 16, and at Monte Alban, altitude 1840 m., 26 July, and in November, 1894, no. 148; C. G. Pringle, Monte Alban, altitude 1780 m., 23 November, 1894, no. 5836, and in the same locality, July 1897, no. 6724; Rev. Lucius C. Smith, El Parin, Oaxaca, 15-17 June, 1895, and in October, 1894, no. 445; C. Conzatti and V. González, San Martin, Etna, Oaxaca, altitude 1800 m., 13 June and 8 August, 1897, no. 308. Said to be a "wonderfully beautiful climber with royal purple flowers."

*Distictis cinerea*. *Pithecoctenium cinereum*, DC. Prodr. ix. 195. Although only flowering specimens of this species are at hand, I have no hesitation in transferring it to the genus *Distictis* as its affinity is clearly with *D. laxiflora* and *D. gnaphalantha*. *D. cinerea* differs from *D. laxiflora* by the more ovate or oval character of the leaflets and the more dense cinereous pubescence on leaves and branches. — To this species may be referred specimens collected by E. W. Nelson near Tamaulapam, altitude 2000 to 2150 m., 16 November, 1894, no. 1958. M. Casimir DeCandolle has very kindly identified this as well as the preceding species with the types in the DeCandolle Herbarium at Geneva.

*DISTICTIS GNAPHALANTHA*, Benth. & Hook. f. Gen. ii. 1038. To this species may be referred specimens collected by Mr. Robert Combs at Calicita, Cuba, 31 May, 1895, no. 106, distributed under *Bignonia gnaphalantha*, Rich.

*DYSCHORISTE QUADRANGULARIS*, O. Kuntze, Rev. Gen. Pl. ii. 486. *Calophanes quadrangularis*, Oerst., Vidensk. Meddel. 1854, 120. It is interesting to note that this apparently rare plant has been collected at Las Canoas, State of San Luis Potosi, 29 August, 1891, Pringle, no. 5020. Mr. Pringle's plant hitherto having been confused with *D. bilabatus*, O. Kuntze, l. c. (*Calophanes bilabatus*, Seem.), from which species, however, it is readily distinguished by the smaller flowers, and by the absence of a glandular pubescence.

*BELOPERONE COMOSA*, Nees in DC. Prodr. xi. 416; Hemsl. Biol. Cent.-Am. Bot. ii. 516. *B. Pringlei*, Wats. Proc. Am. Acad. xxv. 160. The type of Dr. Watson's *B. Pringlei*, upon careful comparison with an authentic specimen of the above species collected at Monterey by Dr. Edwards, shows an exact correspondence in every regard, and it also

agrees well with the original description. It therefore seems best to regard *B. Pringlei*, Wats., as synonymous with *B. comosa*, Nees.

To this species also may be referred Dr. Coulter's no. 1193; and Pringle's plant, collected in Tamasopa Cañon, State of San Luis Potosi, 10 June, 1890, no. 3074, distributed as *B. Pringlei*, Wats.

**Beloperone Nelsonii.** Erect: stems branching, subterete, covered with a spreading or slightly reflexed grayish pubescence: leaves ovate-lanceolate or oblong-lanceolate, 5 to 10 cm. long, 2 to 4 cm. broad, obtuse at the apex, entire, narrowed below into a slender petiole, densely lineolate above, pubescent on either surface, especially on the veins, later becoming glabrous; petioles about 2 cm. in length: inflorescence terminating the stem and branches in rather close bracteate spikes: bracts oblong or obovate: bracteoles linear, nearly 1 cm. long, exceeding the calyx: calyx about 5 mm. long, deeply 5-parted; divisions nearly equal, lanceolate, acute, ciliate: corolla 2 to 2.5 cm. long; tube exceeding the limb; upper lip shortly 2-lobed, the lower more deeply 3-lobed, rather broad, somewhat plaited in the throat: capsule 10 to 12 mm. long, pubescent. — Collected by E. W. Nelson on Maria Madre Island of the Tres Marias group of islands, 3–25 May, 1897, no. 4246.

A species closely resembling *B. comosa*, Nees, but with a much shorter corolla, and broader lower lip. The leaves are also somewhat larger, longer petioled and much less pubescent. It may be that further material will prove this to be a variety of *B. comosa*, Nees, but, as the material at hand shows no sign of intergradation, it seems best for the present at least to regard Mr. Nelson's plant as a distinct species.

**PORTLANDIA PTEROSPERMA**, Wats. Proc. Am. Acad. xxiv. 52. Excellent fruiting specimens were collected by Mr. E. W. Nelson on Maria Madre Island, 3–25 May, 1897, no. 4211, but for the slightly thicker leaves, correspond accurately with the type of the above species. Mr. Nelson's specimens show well the oblong-obovoid longitudinally ribbed and conspicuously lenticulated septically dehiscent (2.5 cm. long) capsule.

**Machaonia floribunda.** Shrub or small tree, 3 to 5 m. high: branches covered with a reddish brown bark, and dotted with numerous small lenticels: the ultimate branches finely pubescent: leaves petiolate, ovate to ovate-lanceolate, 2 to 5 cm. long, 1 to 2 cm. broad, acuminate, acute, entire, ciliate-scabrous, narrowed below into a pubescent petiole (2 to 5 mm. long), glabrous or puberulent on the upper surface, below glabrous except on the midrib toward the base: stipules (1 or 2) linear-subulate, 2 to 3 mm. long: inflorescence of compound many flowered



rather closely appressed-pubescent cymes: bracts and bractlets linear-subulate: flowers 4-merous: calyx-tube densely covered with a white appressed pubescence; lobes subequal, about 1 mm. long, obtuse, ciliate: corolla white, 3 mm. long, villous-pubescent on the throat and on the tube: fruit not seen. — Collected by C. G. Pringle on hills near Tampico, 16 June, 1897, no. 6641.

*Lobelia tarsophora*, Seaton in Mss. Stem erect, simple or branched at the base, 3 to 4.5 dm. high: leaves petiolate, membranaceous, ovate-lanceolate, acuminate, unequal and oblique at the base, undulate and mucronate-denticulate, nearly smooth, 5 to 7.5 cm. long, 2.5 cm. broad. racemes long, loosely flowered: bracts 2 mm. in length: pedicels 10 to 16 mm. long, spreading, becoming horizontal in fruit: corolla blue and white, 4 to 5 mm. in length, the lips unequal: calyx-tube becoming hemispherical in fruit, its rim and ribs persisting after the dehiscence and fall of the small globose half inferior capsule. — Collected by Henry E. Seaton on river banks near Cordoba, altitude 830 m., 20 August, 1891, no. 417. This species is well marked by its foliage, horizontal pedicels, and the peculiar persistence of the rim and nerves of the calyx-tube as a basket-like frame after the dehiscence of the capsule. In habit it most nearly resembles *L. novella*, Rob.

*Zexmenia Pringlei*. Perennial, stems striate, covered with an arachnoid pubescence: lower leaves opposite, the upper alternate, short-petiolate, ovate, 1.5 to 3 cm. long, two thirds as broad, obtuse at the apex, subcordate at the base, rugose and appressed-tuberculate-hispid above, densely tomentose beneath; petioles 4 to 7 mm. long, narrowly winged; heads including the rays 3 cm. broad, terminating the stem and branches, usually on long peduncles: involucre about 3-seriate; outer scales foliaceous, the inner straw-colored, oblong to oblong-lanceolate, about 1 cm. long, acutish, distinctly 1-nerved, glabrous or nearly so on either surface, long-ciliate on the erose margins toward the apex: pales lance-attenuate, about equalling the flowers, somewhat hirtellous on the distinct keel: ray-flowers 1-seriate, rather numerous (about eighteen); rays oblong, 12 mm. long, nearly one half as broad; akenes triangular becoming somewhat verrucose at maturity: disk-flowers about 1 cm. long; pappus bisetose with minute intermediate scales; mature akenes laterally compressed, with a narrow ciliated cartilaginous wing, glabrous or a little roughened, about 4 mm. long. — Collected by C. G. Pringle on limestone hills near Tehuacan, altitude 2000 m., 5 August, 1897, no. 6768.